PATENT ABSTRACTS OF JAPAN

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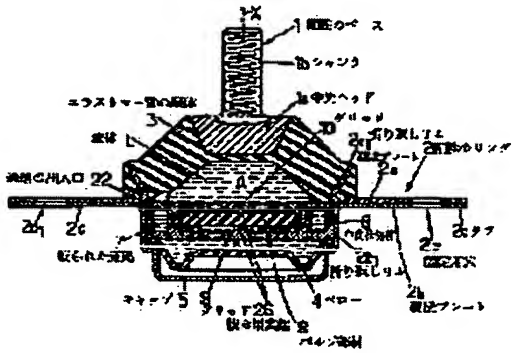
(54) HYDRAULIC ANTI-VIBRATION SUPPORT

(57)Abstract:
PURPOSE: To reduce collision sound or undesirable noises to be generated by discontinuity of reciprocating displacement of a conventional valve member.
CONSTITUTION: A hydraulic anti-vibration support is composed of two rigid frame members, one elastomer body, two sealing chambers, a restricted passage 7 for communicating the chambers with each other, a valve member 8 defining parts of the two chambers and having a rotational axis, and two grids 9, 10 positioned across the valve member and for limiting the movement of the valve member. A plurality of ribs 25 are provided in order to press the valve member against the grids substantially and angularly around the axis, and the ribs are distributed and arranged around the axis so as not to be angularly repeated.



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CLAIMS

[Claim(s)]
[Claim 1] Two rigid frame members fixed to each thing of two elements which should be combined (1 2), The body of the quality of an elastomer which combines between these two frame members (1 2), and forms two seal chambers (A, B) partially at least with them (3), The extracted path which is making between these two chambers open for free passage eternally (7), The liquid of a constant rate which it is full of into the path (7) extracted as two chambers (A, B) (L), The bulb member which makes the form of the plate made with the ingredient which carries out elastic deformation, is carrying out the limitation of other chambers which are the 2nd thing of said two chambers as desirably as one [at least] thing of two chambers (A, B), and has the axis of rotation (X) or the like (8), At least one grid which restricts migration of said bulb member (8) (9 10), while [in addition,] a bulb member (8) moves -- a bulb member -- a grid (9 10) -- the surroundings of an axis (X) -- an include angle ---like -- one by one -- push -- this -- it changes including the means (25) made like -- The oleo damper characterized by the aforementioned means (25) being the thing of the inhomogeneity which does not have a repeat in include angle over the whole surroundings of an axis (X) in the oleo damper designed so that it might be inserted between two rigid elements.
[Claim 2] It is the oleo damper according to claim 1 by which the means (25) of inhomogeneity is constituted from include-angle-inhomogeneity without the repeat to which it is [to which it comes to contact mutually while said bulb member moves partially at least] in at least one thing of the field of a grid (9 10), and the field of a bulb member (8).
[Claim 3] It is the oleo damper according to claim 1 by which the means of inhomogeneity is constituted from include-angle-inhomogeneity which does not have a repeat in the rigidity of a bulb member partially at least.
[Claim 4] The oleo damper according to claim 1 in which the field (11b, 12b) from which it withdrew along with some things of the slot (11a, 12a) currently formed so that it may penetrate to at least one thing in a grid (9 10) at least is established in the field of these grids facing a bulb member (8).

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the oleo damper for [for periodic damping and association between the chassis of an automobile, and two rigid elements like the engine of an automobile] preparing again for support.
[0002] Two rigid frame members by which this invention is fixed to each thing of two elements which should be combined also in such an oleo damper if it says more specifically, The body of the quality of an elastomer which combines between these two frame members and forms two seal chambers partially at least with them, The extracted path which is making between these two chambers open for free passage eternally, The liquid of a constant rate which it is full of into the path extracted as two chambers, Make the form of the plate made with the ingredient which carries out elastic deformation, and the limitation of other chambers which are the 2nd thing of said two chambers as desirably as one [at least] thing of two chambers is carried out. It is related with oil pressure Tampa which changes including at least one grid which restricts migration of the bulb member which has the axis of rotation or the like, and said bulb member.
[0003]
[Description of the Prior Art] Reciprocation deformation of the bulb member which carries out alternation of the vibration with a high frequency like vibration generated in such an oleo damper by the engine under idling and the small amplitude quickly, and is continued so that it may be well-known, i.e., reciprocation deformation of the bulb member made suitable for it being perpendicular and decreasing transfer of the vibration in question to the bulb member itself, is made to cause.
[0004] In being vibration with large amplitude like vibration by the irregularity of a road surface while the automobile is running the ground, or change of an inclination in contrast with it, and a low frequency The greatest amplitude which a bulb member can deform is reached. A liquid from one thing of two chambers to the thing of another side And it is conversely moved through the extracted path again, and when the liquid of a constant rate moved such reaches the predetermined value which is the function of the ratio between the shaft-orientations die length of a path to which the frequency of the vibration was extracted, and the direction cross section of a right angle, it will resonate. Such resonance serves to realize attenuation of a request of the vibration in question.
[0005] The discontinuity in reciprocation displacement of a bulb member and the discontinuity resulting from the limitation imposed on migration of a bulb member by the grid which cooperates with a bulb member especially make a collision sound and the noise which is not desirable start, and it can also become an inconvenient thing. In the case of the oleo damper attached in the commercial automobile by which to make the vehicle room for PAX as quiet as possible is desired, especially this is applied.
[0006]
[Problem(s) to be Solved by the Invention] The main purpose of this invention is to lessen such a fault.
[0007] this person — already — the 91st — one oleo damper of the above-mentioned type is proposed in this person's France patent application accepted by the number of No. 03579. In the oleo damper, two or more swelling sections in which the field of a bulb member was united with it are included. Between actuation of a bulb member, these swelling section is compressed one by one in the grid which restricts migration of a bulb member, and expands elastically after that. If it says in more detail, when there is the aforementioned swelling section, a bulb member a form uniform in include angle — a grid — push — this — as the block also with the uniform field which the form which lenticulated in the hoop direction is made to deform, and is in each of which swelling section side of a bulb member — the field for support of a grid — push — this — The field will be contacted one by one in include angle.
[0008] In the embodiment indicated in the aforementioned patent application, the appearance of a bulb member is circular, and the swelling section is prepared in the form of an annular ring, and is equally distributed on the ring.
[0009] The oleo damper of having two or more protrusion variant sections also has the well-known field of a bulb member. These variant section is distributed in the form uniform in include angle on the aforementioned field, and it may be said that a certain amount of attenuation of the aforementioned collision sound or the noise which is not desirable is reached by it existence.
[0010]
[Means for Solving the Problem] If the oleo damper proposed by this invention is used, larger attenuation of the aforementioned collision sound or the noise which is not desirable will be obtained.
[0011] the form of [for this purpose / in / the bulb member under migration / a grid / include angle] sequential in the oleo damper of this invention — push — this — for the purpose of including the means for making it like, it is the oleo damper of the above-mentioned class, and the still more nearly aforementioned means is characterized by showing include-angle-inhomogeneity without the repeat around an axis.
[0012] That is, any symmetric property is barred in the hit by the grid of a bulb member.
[0013] It is advantageous that the above-mentioned oil pressure bulb includes the following various descriptions in the combination which comes out as much as possible independently or technically.
[0014] The means of inhomogeneity should consist of include-angle-inhomogeneity without the repeat which is [which comes to contact mutually while said bulb member moves partially at least] one of at least one thing of the field of a grid, and the field of a bulb member.
[0015] Surface inhomogeneity should originate in the overall appearance of that.
[0016] Originate in existence of at least one relief component which surface inhomogeneity has projected to the overall appearance.
[0017] Such one relief component should be prolonged covering the include angle which is not larger than one fifth of the include angles between the appearance of relief, and the appearance of the nearest relief.
[0018] At least one thing of relief components should be a rib.
[0019] At least one thing of relief components should be a stud.
[0020] An uneven front face should be the contact surface of a grid.
[0021] When the bulb member is attached so that the deformation restricted between two grids may be possible, surface heterogeneity be related to only one of two locations as for which a bulb member and a grid carry out mutual contact.
[0022] The means of inhomogeneity should consist of include-angle-inhomogeneity which does not have a repeat in the rigidity of a bulb member partially at least.

[0023] The rigid heterogeneity of a bulb member should originate in change of the thickness of that.
[0024] Originate in the insertion into which [redacted]st one rigidity which is different from each other c[redacted]ated, and the rigid heterogeneity of a bulb member went.
[0025] Be prepared near at least one thing in the penetration orifice in which the path where some things of the means of heterogeneity were extracted at least is carrying out opening into the chamber.
[0026]
[Example] Explanation of the following specific example of this invention is an object for explanation purely, and is not restrictive. It should be read the following explanation referring to an attached drawing.
[0027] Especially the oleo damper that constitutes this example so that it may see by drawing 1 The rigid base 1 which changes including central head 1a prolonged up as shank 1b ****ed and attached in an ordinary form is also. It has the perpendicular axis X and consists of two annular plate 2a which lapped mutually and 2bs. Each of these annular plates It sets inside and they are a reference number two a1 and 2b1 to each. It is formed so that it may have the shown clinch rim. These two plates Hole 2c1 for immobilization which has extended outside so that tab 2c in the location which conflicts on two diameters may be formed, and was penetrated to each thing of tab 2c Existing rigid Ring 2. The work as a support by making the truncated cone form around Axis X, and having the good resistance to compression of shaft orientations Nothing. The wall 3 of the thick quality of an elastomer which has combined the base 1 with Ring 2 with airtight **** type, and has become breadth from the aforementioned base at last to the direction of plate 2a, The bellows 4 which is combined with Ring 2 with airtight **** type, and has demarcated one housing by working with the ring, a wall 3, and the base 1 and which is thin and is supple, The rigid cap 5 with which the perimeter for protecting a bellows 4 is being fixed to Ring 2, The rigid middle batch object 6 which is dividing housing into two chambers A, i.e., the actuation chamber near the wall 3, and the compensation chamber B near the bellows 4 further, The extracted path 7 which has connected between two chambers A and B and is formed in the periphery of the middle batch object 6, Between two grids 9 and 10 which are the components of the liquid L of a constant rate, and the middle batch object 6 it is [components] full of the path extracted as two chambers It is attached in the value also with the amplitude of shaft-orientations migration of which own point smaller than 1mm so that it may be desirably restricted to the value of 0.5mm order, and the appearance became it including the bulb member which is making the form of the disk of the circular quality of an elastomer.
[0028] Edge 2b1 The batch object 6, the bellows 4, and the circumference edge of three persons of cap 5** are surrounded. The bellows 4 of flexibility is being fixed to Ring 2 by clamping the circumference of that between the circumference edge of cap 5, and the boundary region of the batch object 6. Because of this purpose, the batch object 6, a bellows 4, and three persons of cap 5** are edge 2b1. By inserting the circumference of an end into the direction of the circumference of cap 5, it is the large bottom surface part and edge 2b1 of a wall 3 of a truncated cone form. It is fixed in between.
[0029] Edge two a1 of plate 2a The form of the truncated cone which has spread towards the virtual base most distant from a part for the principal part of a plate is made. This edge two a1 It is thick and is embedded in the large bottom surface part of the wall 3 of a truncated cone form.
[0030] 10, and a membrane 8 and the thing which is ******** have a circular appearance in a grid 9 again, and it centers on Axis X.
[0031] If from drawing 2 to drawing 4 is seen especially, it will be known that the middle batch object 6 mainly consists of two components 11 and 12 which fit in each other, and the wall of overlap and both cooperated, and these components demarcated housing 8a for the bulb member 8, and have also demarcated the extracted path 7 in addition.
[0032] Components 11 are constituted by the annular slot 13 where the appearance is surrounding the circular grid 9 and its grid 9. Therefore, the limitation of the slot 13 is carried out to the skirt board 19 which is surrounding the periphery of the inside skirt board 15 which is surrounding the grid 9 to the cylindrical shape, the even annular end wall 17, and its end wall 17. The inside skirt board 15 is prolonged from the grid 9 and the end wall 17 covering the height which is mostly equivalent to the height of housing 8a of the bulb member 8. The height of a skirt board 19 supports the one half of the height of a path 7. An end wall 17 is penetrated and the entrance 21 is formed so that the path 7 where the liquid for vibration deadening was extracted can be frequented.
[0033] Like it, components 12 change including the grid 10 and the slot 14, and, therefore, the slot 14 is limited to an end wall 18, two skirt boards 16, i.e., an inside skirt board, and the outside skirt board 20. There is an entrance 22 which penetrates it in an end wall 18.
[0034] Both of paries-lateralis-orbitae sides of a skirt board 16 and inside wall surfaces of a skirt board 15 are truncated cone forms mostly, and have a form which fits in each other. When components 11 and 12 are assembled, these skirt boards realize airtight **** clamping by fitting in each other. For skirt boards 19 and 20, a diameter is the same and both free-end edge is edge 2b1. By the above-mentioned clamping performed by inserting in, it is push this slack to mutual with airtight **** type.
[0035] The extracted path 7 has extended over the perimeter around grids 9 and 10 mostly. The limitation of the slot 13 is carried out by the amount of [which is in the place which was mostly equal to opening 22, and has become the airtight **** partition section between the edges of both paths 7 / 23] wall in the edge of that most separated from opening 21 in include angle. The skirt board 20 is interrupted at the place which is equal to the partition section 23 and opening 22. Since opening 20a formed so that a skirt board 20 might be penetrated by it has a dimension of the partition section 23, and a dimension which fits in each other, when components 11 and 12 are assembled, opening 20a engages with the partition section 23 with airtight **** type.
[0036] The slot shown with reference numbers 11a and 12a, respectively is formed so that the wall of grids 9 and 10 may be penetrated. These slots are equally distributed also in which of grids 9 and 10 involving two main perimeters. Between slot 11a comrades and among 12a comrades, the ring 27 and arm 24 as a solid-state are prolonged, and these rings and an arm constitute the back face which serves as a partner whom the field of the bulb member 8 asks. Each of grids 9 and 10 has the central projection 26, and the bulb member 8 is pinched among these projection comrades.
[0037] More specifically, this invention relates to grids 9 and 10 and the bulb member 8. On the field of two or more radial arms 24 of the grid 9 which serves as a partner whom the bulb member 8 asks, distribution arrangement of the radial rib 25 is carried out, and these ribs 25 are prolonged toward the center of a grid from the perimeter field in which the edge of a skirt board 16 of a grid 9 is held. The arm 24 nearest to opening 21 is supporting the rib 25 with which it has extended covering the overall length mostly until it results in the projection 26 for clips of a grid 9. While an include angle increases, the rib 25 which die length is reducing is formed in three arms 24 which follow it in the given direction in include angle. Other two radial arms 24 of a grid and especially the arm nearest to opening 22 do not have such a rib 25. The grid 10 is not supporting the rib in anywhere. Therefore, distribution arrangement of the rib 25 will be carried out in the form which is uneven and does not have a repeat in the surroundings of an axis.
[0038] The include-angle-thickness of each rib 25 is about 1mm, and is separated with a larger distance than 10mm between the points nearest to both the ribs 25 of two ******. Therefore, the include angle between the appearance comrades of the rib 25 of two ****** is larger than 10 times of the include angle to which such one rib 25 has extended.
[0039] While the bulb member 8 deforms, this bulb member is compressed involving the place of two or more ribs 25 one by one in include angle. The symmetric property of a motion of how these ribs are prepared, therefore the bulb member 8 is broken. The phenomenon of the noise which is not desirable and collision sound resulting from the discontinuity of reciprocation displacement of a bulb member and an impact in case the bulb member hits a radial and the annular field for support especially is reduced fairly. Reduction of this phenomenon that is not desirable is emphasized again according to locating the largest rib 25 near the entrance (opening 21) of the extracted path 7, and the fact that

the grid 10 does not have the rib in anywhere.

[0040] The embodiment of deformation of [redacted] is also possible. the arrangement which does not h[redacted] repeat about the axis of a grid and a bulb member instead of a rib — what kind o[redacted] others — a stud may be especially used also for re[redacted]s for a stud, it is advantageous to ********** a grid, and for it to be made and to make the form of a cap of the spherical surface.

[0041] Although the bulb member may be supporting uneven relief, therefore, larger attenuation is obtained by the relief supported with the grid, and the relief which works like the projection 26 for being supported by especially one grid and pinching a bulb member.

[0042] Both sides which contact do not have relief, and attenuation of the phenomenon of a collision sound or the noise which is not desirable is obtained also when presenting the whole profile which is uneven in include angle and does not have a repeat over the whole surroundings of the axis of a grid and a bulb member. It is uneven in such a whole profile in include angle, and it is advantageous to it that relief without a repeat cooperates.

[0043] a bulb member — said grid — an include angle ——like — one by one — push — this — it may be attained also when the bulb member from which rigidity became the ununiformity which does not have a repeat about the above-mentioned axis is used for things. For this purpose, although a bulb member is with an ingredient uniform in include angle, if thickness is made with the thickness which is changing in the form which does not have a repeat in include angle, it is good. It may be made as distribution arrangement of one or more insertions being carried out through the thickness of a bulb member so that it may be an ingredient with an uneven bulb member as an alternative plan, that is, uneven rigidity may be given to a bulb member.

[0044] According to the place which experience shows, it is still more nearly especially advantageous to form the retreating fields 11b and 12b, i.e., a "spot face", in the field of a grid which faces the bulb member 8 along with some things of the slots 11a and 12a in a grid at least. Although these spot faces may be formed with milling, die forming of a corresponding grid and one may also be formed and the discontinuity of the front face resulting from such a retreating field strengthens the desirable collision sound mitigation effectiveness by unsymmetrical relief.

[0045] It is natural, and that there is never nothing, rather, this invention develops into any of it deformation, and goes reverse by this invention being limited to application of the specification explained specifically still more, or an example so that it may be known also from an above-mentioned thing. It will be as follows if especially these deformation is shown.

[0046] Deformation of having the appearance to which a bulb member is not circular and limits one axis (that is, the appearance of a bulb member is repeated by only 2 pi/n having been rotated by the bulb member around said axis by making n into an integer) similar to an axis of rotation, for example, the axis of a repeat, deformation that the appearance of a bulb member is an ellipse form or a rectangle especially.

[0047] Deformation that the bulb member in which it connects with juxtaposition and two oleo dampers were divided into two controls the free passage between chambers of these two oleo dampers.

[0048] The bulb member between two grids of an absorber is not prepared in the middle batch object 6. Although it is prepared another location on the medial surface of the actuation chamber A, especially near the base 1, the bulb member is controlling the free passage between Chamber A and the 3rd chamber (not shown) and the 3rd chamber is deformable similarly It is limited by the membrane of the flexibility attached in airtight especially for this purpose, and the field which is the outside of the chamber of that membrane in question Deformation that you may connect with atmospheric air directly although one air chamber is limited and the air chamber may be lined with a form ingredient as an option.

[0049] Deformation that it is the thing of the form of a sleeve where the oleo damper in question operates so that a diameter may essentially be met, and two rigid frame members of a there are tubular, there is one thing inside the thing of another side, and they are in this alignment with circular symmetric property desirably where a load is applied at least.

[0050] Deformation that one thing of the frame member which constitutes the oleo damper is making the form of the tube which has penetrated the oleo damper, and a bulb member is one annular plate which is surrounding the frame member.

[0051] Deformation that the extracted path is formed in parts other than the periphery of the middle batch object of an oleo damper so that it may pass along the central field of the bulb member itself especially.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Industrial Application] This invention relates to the oleo damper for [for periodic damping and association between the chassis of an automobile, and two rigid elements like the engine of an automobile] preparing again for support.
[0002] Two rigid frame members by which this invention is fixed to each thing of two elements which should be combined also in such an oleo damper if it says more specifically, The body of the quality of an elastomer which combines between these two frame members and forms two seal chambers partially at least with them, The extracted path which is making between these two chambers open for free passage eternally, The liquid of a constant rate which it is full of into the path extracted as two chambers, Make the form of the plate made with the ingredient which carries out elastic deformation, and the limitation of other chambers which are the 2nd thing of said two chambers as desirably as one [at least] thing of two chambers is carried out. It is related with oil pressure Tampa which changes including at least one grid which restricts migration of the bulb member which has the axis of rotation or the like, and said bulb member.

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PRIOR ART

[Description of the Prior Art] Reciprocation deformation of the bulb member which carries out alternation of the vibration with a high frequency like vibration generated in such an oleo damper by the engine under idling and the small amplitude quickly, and is continued so that it may be well-known, i.e., reciprocation deformation of the bulb member made suitable for it being perpendicular and decreasing transfer of the vibration in question to the bulb member itself, is made to cause.

[0004] In being vibration with large amplitude like vibration by the irregularity of a road surface while the automobile is running the ground, or change of an inclination in contrast with it, and a low frequency The greatest amplitude which a bulb member can deform is reached. A liquid from one thing of two chambers to the thing of another side And it is conversely moved through the extracted path again, and when the liquid of a constant rate moved such reaches the predetermined value which is the function of the ratio between the shaft-orientations die length of a path to which the frequency of the vibration was extracted, and the direction cross section of a right angle, it will resonate. Such resonance serves to realize attenuation of a request of the vibration in question.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] The main purpose of this invention is to lessen such a fault.
[0007] this person — already — the 91st — one oleo damper of the above-mentioned type is proposed in this person's France patent application accepted by the number of No. 03579. In the oleo damper, two or more swelling sections in which the field of a bulb member was united with it are included. Between actuation of a bulb member, these swelling section is compressed one by one in the grid which restricts migration of a bulb member, and expands elastically after that. If it says in more detail, when there is the aforementioned swelling section, a bulb member a form uniform in include angle — a grid — push — this — as the block also with the uniform field which the form which lenticulated in the hoop direction is made to deform, and is in each of which swelling section side of a bulb member — the field for support of a grid — push — this — The field will be contacted one by one in include angle.
[0008] In the embodiment indicated in the aforementioned patent application, the appearance of a bulb member is circular, and the swelling section is prepared in the form of an annular ring, and is equally distributed on the ring.
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[Translation done.]

MEANS

[Means for Solving the Problem] If the oleo damper proposed by this invention is used, larger attenuation of the aforementioned collision sound or the noise which is not desirable will be obtained.
[0011] the form of [for this purpose / in / the bulb member under migration / a grid / include angle] sequential in the oleo damper of this invention -- push -- this -- for the purpose of including the means for making it like, it is the oleo damper of the above-mentioned class, and the still more nearly aforementioned means is characterized by showing include-angle-inhomogeneity without the repeat around an axis.
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EXAMPLE

[Example] Explanation of the following specific example of this invention is an object for explanation purely, and is not restrictive. It should be read the following explanation referring to an attached drawing.
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[0030] 10, and a membrane 8 and the thing which is ******** have a circular appearance in a grid 9 again, and it centers on Axis X.
[0031] If from drawing 2 to drawing 4 is seen especially, it will be known that the middle batch object 6 mainly consists of two components 11 and 12 which fit in each other, and the wall of overlap and both cooperated, and these components demarcated housing 8a for the bulb member 8, and have also demarcated the extracted path 7 in addition.
[0032] Components 11 are constituted by the annular slot 13 where the appearance is surrounding the circular grid 9 and its grid 9. Therefore, the limitation of the slot 13 is carried out to the skirt board 19 which is surrounding the periphery of the inside skirt board 15 which is surrounding the grid 9 to the cylindrical shape, the even annular end wall 17, and its end wall 17. The inside skirt board 15 is prolonged from the grid 9 and the end wall 17 covering the height which is mostly equivalent to the height of housing 8a of the bulb member 8. The height of a skirt board 19 supports the one half of the height of a path 7. An end wall 17 is penetrated and the entrance 21 is formed so that the path 7 where the liquid for vibration deadening was extracted can be frequented.
[0033] Like it, components 12 change including the grid 10 and the slot 14, and, therefore, the slot 14 is limited to an end wall 18, two skirt boards 16, i.e., an inside skirt board, and the outside skirt board 20. There is an entrance 22 which penetrates it in an end wall 18.
[0034] Both of paries-lateralis-orbitae sides of a skirt board 16 and inside wall surfaces of a skirt board 15 are truncated cone forms mostly, and have a form which fits in each other. When components 11 and 12 are assembled, these skirt boards realize airtight **** clamping by fitting in each other. For skirt boards 19 and 20, a diameter is the same and both free-end edge is edge 2b1. By the above-mentioned clamping performed by inserting in, it is push this slack to mutual with airtight **** type.
[0035] The extracted path 7 has extended over the perimeter around grids 9 and 10 mostly. The limitation of the slot 13 is carried out by the amount of [which is in the place which was mostly equal to opening 22, and has become the airtight **** partition section between the edges of both paths 7 / 23] wall in the edge of that most separated from opening 21 in include angle. The skirt board 20 is interrupted at the place which is equal to the partition section 23 and opening 22. Since opening 20a formed so that a skirt board 20 might be penetrated by it has a dimension of the partition section 23, and a dimension which fits in each other, when components 11 and 12 are assembled, opening 20a engages with the partition section 23 with airtight **** type.
[0036] The slot shown with reference numbers 11a and 12a, respectively is formed so that the wall of grids 9 and 10 may be penetrated. These slots are equally distributed also in which of grids 9 and 10 involving two main perimeters. Between slot 11a comrades and among 12a comrades, the ring 27 and arm 24 as a solid-state are prolonged, and these rings and an arm constitute the back face which serves as a partner whom the field of the bulb member 8 asks. Each of grids 9 and 10 has the central projection 26, and the bulb member 8 is pinched among these projection comrades.
[0037] More specifically, this invention relates to grids 9 and 10 and the bulb member 8. On the field of two or more radial arms 24 of the grid 9 which serves as a partner whom the bulb member 8 asks, distribution arrangement of the radial rib 25 is carried out, and these ribs 25 are prolonged toward the center of a grid from the perimeter field in which the edge of a skirt board 16 of a grid 9 is held. The arm 24 nearest to opening 21 is supporting the rib 25 with which it has extended covering the overall length mostly until it results in the projection 26 for clips of a grid 9. While an include angle increases, the rib 25 which die length is reducing is formed in three arms 24 which follow it in the given direction in include angle. Other two radial arms 24 of a grid and especially the arm nearest to opening 22 do not have such a rib 25. The grid 10 is not supporting the rib in anywhere. Therefore, distribution arrangement of the rib 25 will be carried out in the form which is uneven and does not have a repeat in the surroundings of an axis.
[0038] The include-angle-thickness of each rib 25 is about 1mm, and is separated with a larger distance than 10mm between the points

nearest to both the ribs 25 of two ******. Therefore, the include angle between the appearance comrades of the rib 25 of two ****** is larger than 10 times of the include angle t[illegible]h such one rib 25 has extended.
[0039] While the bulb member 8 deforms, th[illegible]ulb member is compressed involving the place of tw[illegible]more ribs 25 one by one in include angle. The symmetric property of a motion of how these ribs are prepared, therefore the bulb member 8 is broken. The phenomenon of the noise which is not desirable and collision sound resulting from the discontinuity of reciprocation displacement of a bulb member and an impact in case the bulb member hits a radial and the annular field for support especially is reduced fairly. Reduction of this phenomenon that is not desirable is emphasized again according to locating the largest rib 25 near the entrance (opening 21) of the extracted path 7, and the fact that the grid 10 does not have the rib in anywhere.
[0040] The embodiment of deformation of others is also possible. the arrangement which does not have a repeat about the axis of a grid and a bulb member instead of a rib — what kind of — others — a stud may be especially used also for relief. As for a stud, it is advantageous to ********** a grid, and for it to be made and to make the form of a cap of the spherical surface.
[0041] Although the bulb member may be supporting uneven relief, therefore, larger attenuation is obtained by the relief supported with the grid, and the relief which works like the projection 26 for being supported by especially one grid and pinching a bulb member.
[0042] Both sides which contact do not have relief, and attenuation of the phenomenon of a collision sound or the noise which is not desirable is obtained also when presenting the whole profile which is uneven in include angle and does not have a repeat over the whole surroundings of the axis of a grid and a bulb member. It is uneven in such a whole profile in include angle, and it is advantageous to it that relief without a repeat cooperates.
[0043] a bulb member — said grid — an include angle ——like — one by one — push — this — it may be attained also when the bulb member from which rigidity became the ununiformity which does not have a repeat about the above-mentioned axis is used for things. For this purpose, although a bulb member is with an ingredient uniform in include angle, if thickness is made with the thickness which is changing in the form which does not have a repeat in include angle, it is good. It may be made as distribution arrangement of one or more insertions being carried out through the thickness of a bulb member so that it may be an ingredient with an uneven bulb member as an alternative plan, that is, uneven rigidity may be given to a bulb member.
[0044] According to the place which experience shows, it is still more nearly especially advantageous to form the retreating fields 11b and 12b, i.e., a "spot face", in the field of a grid which faces the bulb member 8 along with some things of the slots 11a and 12a in a grid at least. Although these spot faces may be formed with milling, die forming of a corresponding grid and one may also be formed and the discontinuity of the front face resulting from such a retreating field strengthens the desirable collision sound mitigation effectiveness by unsymmetrical relief.
[0045] It is natural, and that there is never nothing, rather, this invention develops into any of it deformation, and goes reverse by this invention being limited to application of the specification explained specifically still more, or an example so that it may be known also from an above-mentioned thing. It will be as follows if especially these deformation is shown.
[0046] Deformation of having the appearance to which a bulb member is not circular and limits one axis (that is, the appearance of a bulb member is repeated by only 2 pi/n having been rotated by the bulb member around said axis by making n into an integer) similar to an axis of rotation, for example, the axis of a repeat, deformation that the appearance of a bulb member is an ellipse form or a rectangle especially.
[0047] Deformation that the bulb member in which it connects with juxtaposition and two oleo dampers were divided into two controls the free passage between chambers of these two oleo dampers.
[0048] The bulb member between two grids of an absorber is not prepared in the middle batch object 6. Although it is prepared another location on the medial surface of the actuation chamber A, especially near the base 1, the bulb member is controlling the free passage between Chamber A and the 3rd chamber (not shown) and the 3rd chamber is deformable similarly It is limited by the membrane of the flexibility attached in airtight especially for this purpose, and the field which is the outside of the chamber of that membrane in question Deformation that you may connect with atmospheric air directly although one air chamber is limited and the air chamber may be lined with a form ingredient as an option.
[0049] Deformation that it is the thing of the form of a sleeve where the oleo damper in question operates so that a diameter may essentially be met, and two rigid frame members of a there are tubular, there is one thing inside the thing of another side, and they are in this alignment with circular symmetric property desirably where a load is applied at least.
[0050] Deformation that one thing of the frame member which constitutes the oleo damper is making the form of the tube which has penetrated the oleo damper, and a bulb member is one annular plate which is surrounding the frame member.
[0051] Deformation that the extracted path is formed in parts other than the periphery of the middle batch object of an oleo damper so that it may pass along the central field of the bulb member itself especially.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the axial sectional view of the oleo damper which constitutes the specific example of this invention.
[Drawing 2] It is the plan of each grid of the oleo damper of drawing 1 .
[Drawing 3] It is the bottom view of each grid of the oleo damper of drawing 1 .
[Drawing 4] It is the sectional view also showing the grid of the bulb member and another side of the oleo damper of drawing 1 besides a cross section in alignment with line IV-IV of the grid of drawing 2 .
[Description of Notations]
1 Rigid Base
1a Central head
1b Shank
2 Rigid Ring
2a, 2b Annular plate
2c Tab
Two a1, 2b1 Clinch rim
2c1 Hole for immobilization
3 Wall of Quality of Elastomer
4 Bellows
5 Rigid Cap
6 Middle Batch Object
7 Extracted Path
8 Bulb Member
8a Housing
9 Ten Grid
11 12 Components of a middle batch object (9, 10, and 7 are included)
11a, 12a Slot
11b, 12b Retreating field
13 14 Slot
15 16 Skirt board
17 18 End wall of a slot
19 20 Skirt board
20a Opening of a skirt board
21 22 Entrance of the extracted path
23 Partition Section (a Part for Wall)
24 Radial Arm
25 Rib
26 Projection for Clips
27 Ring
A, B Chamber
L Liquid

[Translation done.]

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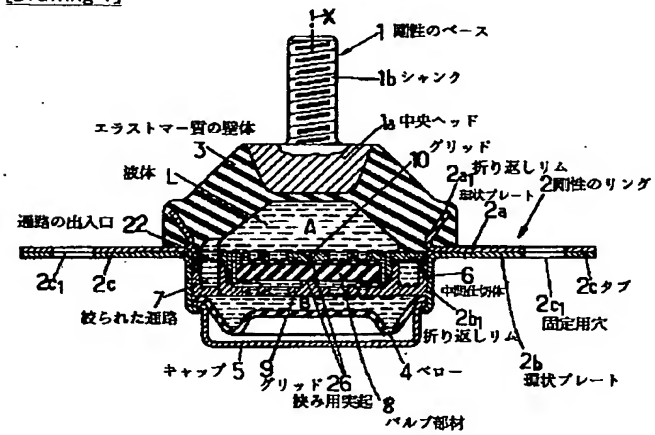
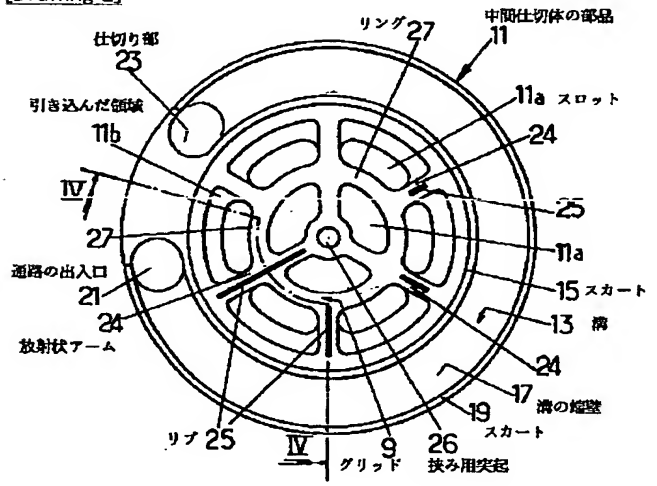
DRAWINGS

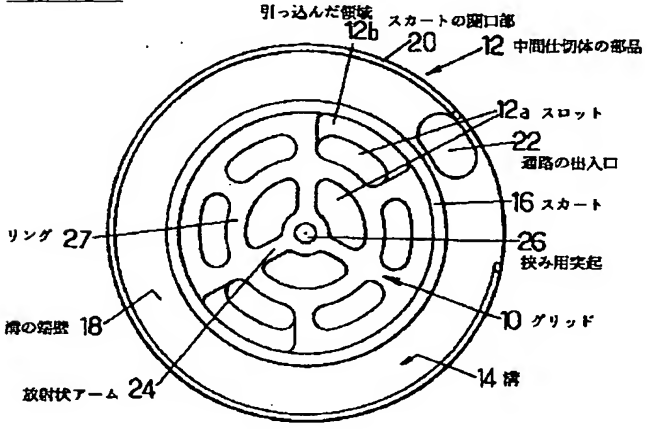
[Drawing 1]



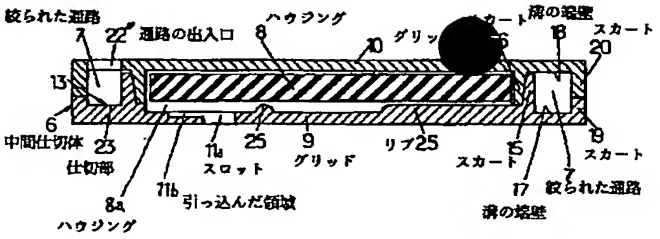
[Drawing 2]



[Drawing 3]



[Drawing 4]



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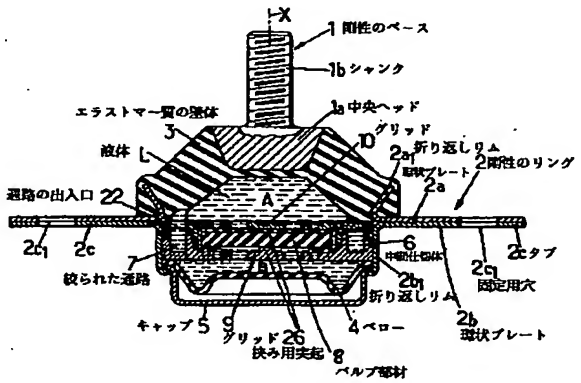
最終頁に続く

(54)【発明の名称】　油圧ダンパ

(57)【要約】

【目的】　従来のバルブ部材の往復動変位の不連続性により起こる衝突音や望ましくない騒音を小さくする。

【構成】　油圧ダンパが、二つの剛性のフレーム部材と、一つのエラストマー質のボディと、二つの密封チャンバーと、それらチャンバー相互間を連通させる絞られた通路（７）と、それら二つのチャンバーの各々での部分を画定していて回転の軸線を有しているバルブ部材（８）と、そのバルブ部材を間に挟んで位置してバルブ部材の移動を制限している二つのグリッド（９，１０）を含んで成っていて、バルブ部材のグリッドへの押し当たりが軸線の回りで角度的に順次になるようにするために、複数のリブ（２５）が設けられていて、それらリブは、軸線の回り全体にわたって角度的に繰り返しがないように分布配置されている。



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【特許請求の範囲】

【請求項１】　結合されるべき二つの要素のそれぞれのものに固定されるようになっている二つの剛性のフレーム部材（１，２）と、それら二つのフレーム部材（１，２）の間を結合してそれらと共に二つの密封チャンバー（Ａ，Ｂ）を少なくとも部分的に形成しているエラストマー質のボディ（３）と、それら二つのチャンバーの相互間を永久的に連通させている絞られた通路（７）と、二つのチャンバー（Ａ，Ｂ）と絞られた通路（７）の中に充満している一定量の液体（Ｌ）と、弾性変形する材料でできたプレートの形をなして二つのチャンバー（Ａ，Ｂ）の少なくとも一方のものと望ましくは前記二つのチャンバーのうちの第２のものである他のチャンバーを限界していて回転の軸線（Ｘ）または類似のものを有しているバルブ部材（８）と、前記バルブ部材（８）の移動を制限する少なくとも一つのグリッド（９，１０）と、なお、バルブ部材（８）が移動する間にバルブ部材がグリッド（９，１０）に軸線（Ｘ）の回りで角度的に順次に押し当たるようにする手段（２５）とを含んで成る、二つの剛性の要素の間に挿入されるように設計された油圧ダンパにおいて、前記の手段（２５）が、軸線（Ｘ）の回り全体にわたって角度的に繰り返しのない不均等性のものであることを特徴とする油圧ダンパ。

【請求項２】　不均等性の手段（２５）が、少なくとも部分的には、前記バルブ部材が移動する間に相互に接触するに至るグリッド（９，１０）の面とバルブ部材（８）の面の少なくとも一つのものにある繰り返しのない角度的不均等性で構成されている、請求項１記載の油圧ダンパ。

【請求項３】　不均等性の手段が、少なくとも部分的には、バルブ部材の剛性での繰り返しのない角度的不均等性で構成されている、請求項１記載の油圧ダンパ。

【請求項４】　グリッド（９，１０）のうちの少なくとも一つのものに貫通するように形成されているスロット（１１ａ，１２ａ）の、少なくとも幾つかのものに沿って、引っ込んだ領域（１１ｂ，１２ｂ）が、バルブ部材（８）に面しているそれらグリッドの面において設けられている、請求項１記載の油圧ダンパ。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、自動車のシャシと自動車のエンジンのような、二つの剛性の要素の間に、振動減衰と結合のため、あるいはまた支持のために設けるための油圧ダンパに関する。

【０００２】より特定的に言うならば本発明は、そのような油圧ダンパの中でも、結合されるべき二つの要素のそれぞれのものに固定されるようになっている二つの剛性のフレーム部材と、それら二つのフレーム部材の間を結合してそれらと共に二つの密封チャンバーを少なくとも部分的に形成しているエラストマー質のボディと、それら二つのチャンバーの相互間を永久的に連通させている絞られた通路と、二つのチャンバーと絞られた通路の中に充満している一定量の液体と、弾性変形する材料でできたプレートの形をなして、二つのチャンバーの少なくとも一方のものと望ましくは前記二つのチャンバーのうちの第２のものである他のチャンバーを限界していて、回転の軸線または類似のものを有しているバルブ部材と、前記バルブ部材の移動を制限する少なくとも一つのグリッド、を含んで成っている油圧タンパに関する。

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【０００３】

【従来の技術】公知であるように、このような油圧ダンパにおいては、アイドリング中のエンジンによって発生される振動のような周波数が高くて振幅が小さい振動は、急速に交番して継続するバルブ部材の往復動変形、すなわち、バルブ部材自体に対して垂直であって問題の振動の伝達を減衰させるに適するバルブ部材の往復動変形を起こさせる。

【０００４】それとは対照的に、自動車が地上を走行している間の路面の不規則性とか傾斜の変化による振動のような、振幅が大きくて周波数が低い振動の場合には、バルブ部材の変形が可能な最大の振幅に達し、液体が、二つのチャンバーの一方のものから他方のものへ、そしてまたその逆に、絞られた通路を経て移動させられ、そのように動かされる一定量の液体は、その振動の周波数が絞られた通路の軸方向長さと直角方向断面積の間の比の関数である所定の値に達したときには、共振することとなる。そのような共振は、問題の振動の所望の減衰を実現する働きをする。

【０００５】バルブ部材の往復動変位における不連続性、特には、バルブ部材と組み合うグリッドによってバルブ部材の移動に課せられた限界に起因する不連続性が、衝突音や望ましくない騒音を起こさせ、それは、不都合なことにもなり得るものである。このことは、特に、乗客用車室を可能な限り静粛にすることが望まれる市販の自動車に取り付けられた油圧ダンパの場合にあてはまる。

【０００６】

【発明が解決しようとする課題】本発明の主たる目的は、このような欠点を少なくすることにある。

【０００７】本出願者は、既に、第91 03579号の番号で受け付けられた本出願者のフランス特許出願の中で、前述のタイプの一つの油圧ダンパを提案している。その油圧ダンパにおいては、バルブ部材の面がそれと一体になった複数の膨らみ部を含んでいる。バルブ部材の作動の間には、それら膨らみ部は、順次、バルブ部材の移動を制限するグリッドに当たって圧縮されてその後に弾性的に膨脹する。より詳しく言うならば、前記の膨らみ部があることにより、バルブ部材は、角度的に均一な形でグリッドに押し当たるのではなく、周方向で波打った形に変形させられるのであり、バルブ部材の、各膨らみ部の

どの側にある領域も、均一なブロックとしてグリッドの支持用面に押し当たるのではなく、角度的に順次、その面と接触することになるのである。

【０００８】前記の特許出願の中に記載された実施態様においては、バルブ部材の外形は円形であり、膨らみ部は、環状のリングの形に設けられていて、そのリング上に均等に分布されている。

【０００９】バルブ部材の面が複数の突出異形部を有しているという油圧ダンパも公知である。それら異形部は、前記の面上に角度的に均一な形で分布されており、それの存在によって前記の衝突音や望ましくない騒音のある程度の減衰が達せられるという可能性はある。

【００１０】

【課題を解決するための手段】本発明によって提案される油圧ダンパを用いるならば、前記の衝突音や望ましくない騒音の、より大きい減衰が得られる。

【００１１】この目的のために、本発明の油圧ダンパは、移動中のバルブ部材が、グリッドに、角度的に順次という形で押し当たるようにするための手段を含んでいるという意味では前述の種類の油圧ダンパであって、なお、前記の手段が、軸線の回りでの繰り返しのない角度的不均等性を示していることを特徴としている。

【００１２】つまり、バルブ部材のグリッドへの当たりにおいては、どんな対称性も妨げられている。

【００１３】上記の油圧バルブが、下記の種々の特徴を、単独または技術的に可能な限りでの組み合わせで含んでいるのが有利である。

【００１４】不均等性の手段が、少なくとも部分的には、前記バルブ部材が移動する間に相互に接触するに至るグリッドの面とバルブ部材の面の少なくとも一つのものにある繰り返しのない角度的不均等性で構成されていること。

【００１５】表面の不均等性が、それの全体的外形に起因していること。

【００１６】表面の不均等性が、全体的外形に対しては突出している少なくとも一つのレリーフ部品の存在に起因していること。

【００１７】一つのそのようなレリーフ部品は、レリーフの外形と最も近くにあるレリーフの外形の間の角度の1/5よりも大きくない角度にわたって延びていること。

【００１８】レリーフ部品の少なくとも一つのものがリブであること。

【００１９】レリーフ部品の少なくとも一つのものがスタッドであること。

【００２０】不均一な表面がグリッドの接触面であること。

【００２１】バルブ部材が、二つのグリッドの間において限られた変形が可能であるように取り付けられているとき、表面の不均一性は、バルブ部材とグリッドが相互接触する二つの場所のうちの、ただ一つのものに関係していること。

【００２２】不均等性の手段が、少なくとも部分的には、バルブ部材の剛性での繰り返しのない角度的不均等性で構成されていること。

【００２３】バルブ部材の剛性の不均一性が、それの厚さの変化に起因していること。

【００２４】バルブ部材の剛性の不均一性が、少なくとも一つの、相異なる剛性が組み合って入ったインサートに起因していること。

【００２５】不均一性の手段の少なくとも幾つかのものが、絞られた通路がチャンバーの中へと開口しているところの貫通オリフィスのうちの、少なくとも一つのものの付近に設けられていること。

【００２６】

【実施例】下記の、本発明の特定の実施例の説明は、純粋に説明用であり、制限的ではない。下記の説明は添付の図面を参照しつつ読むべきものである。

【００２７】特には図１で見られるように、この実施例を構成する油圧ダンパは、普通の形においては、ねじ付きのシャンク１ｂでもって上方に延びている中央ヘッド１ａを含んで成る剛性のベース１と、垂直の軸線Ｘを有して、二つの互いに重なった環状プレート２ａ，２ｂで構成されており、それら環状プレートの各々は、内側においてそれぞれに参照番号２ａ１，２ｂ１で示す折り返しリムを有するように形作られており、それら２枚のプレートは、二つの、直径上相反する位置にあるタブ２ｃを形成するように外側へと延びており、タブ２ｃの各々のものには貫通した固定用の穴２ｃ１がある、剛性のリング２と、軸線Ｘの回りの切頭円錐形をなしていて、軸方向の圧縮に対する良好な抵抗を有することによってサポートとしての働きをなし、ベース１をリング２に気密性ある形で結合しており、前記のベースからプレート２ａの方へと末広がりになっている厚いエラストマー質の壁体３と、リング２に気密性ある形で結合されていて、そのリング、壁体３、およびベース１と共に働くことによって一つのハウジングを画定している、薄くて柔軟性のあるベロー４と、ベロー４を保護するための、周囲がリング２に固定されている剛性のキャップ５と、ハウジングを、二つのチャンバー、すなわち、壁体３の近くの作動チャンバーＡとベロー４の近くの補償チャンバーＢとにさらに分割している剛性の中間仕切体６と、二つのチャンバーＡとＢの間を連結していて、中間仕切体６の周辺部の中に形成されている絞られた通路７と、二つのチャンバーと絞られた通路に充満している一定量の液体Ｌと、中間仕切体６の構成部分である二つのグリッド９，１０の間に、自身のどの点の軸方向移動の振幅も１mmより小さい値に、望ましくは0.5mmのオーダーの値に制限されるように取り付けられていて、外形は円形のエラストマー質のディスクの形をなしているバルブ部材と、を含んで成っている。

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【００２８】エッジ２ｂ１が、仕切体６、ベロー４、およびキャップ５、の三者の周辺エッジを包囲している。柔軟性のベロー４は、それの周辺がキャップ５の周辺エッジと仕切体６の周辺領域の間でクランプされることによって、リング２に対して固定されている。この目的のために、仕切体６、ベロー４、およびキャップ５、の三者は、エッジ２ｂ１の末端部周辺をキャップ５の周辺の方に折り込むことによって、切頭円錐形の壁体３の大きい底面部とエッジ２ｂ１との間において固定される。

【００２９】プレート２ａのエッジ２ａ１は、プレートの主要部分から最も離れた仮想底面に向けて広がっている切頭円錐の形をなしている。このエッジ２ａ１は、厚くて切頭円錐形の壁体３の大きい底面部の中に埋め込まれている。

【００３０】グリッド９と１０、そしてまたメンブレン８、のすべてのものは、外形が円形であって、軸線Ｘを中心にしている。

【００３１】特に図２から図４までを見るならば、中間仕切体６が主として二つの、互いに嵌まり合う部品１１と１２で構成されていて、それら部品は重なり合い、両者の壁が組み合って、バルブ部材８のためのハウジング８ａを画定し、なお、絞られた通路７をも画定している、ということが知られる。

【００３２】部品１１は、外形が円形であるグリッド９と、そのグリッド９を包囲している環状の溝１３によって構成されている。溝１３は、グリッド９を円筒形に包囲している内側スカート１５と、平らな環状の端壁１７と、その端壁１７の外周を包囲しているスカート１９、によって限界されている。内側スカート１５は、グリッド９および端壁１７から、バルブ部材８のハウジング８ａの高さにほぼ対応している高さにわたって延びている。スカート１９の高さは、通路７の高さの半分に対応している。制振用の液体が絞られた通路７に出入りし得るように、端壁１７を貫通して出入り口２１が形成されている。

【００３３】それと同様に部品１２は、グリッド１０と溝１４を含んで成っていて、その溝１４は、端壁１８と二つのスカート、すなわち内側スカート１６と外側スカート２０、によって限定されている。端壁１８には、それを貫通する出入り口２２がある。

【００３４】スカート１６の外側壁面とスカート１５の内側壁面は、どちらもほぼ切頭円錐形で、互いに嵌まり合う形になっている。部品１１と１２が組み立てられたときに、それらスカートは、嵌まり合うことによって気密性あるクランピングを実現する。スカート１９と２０は、直径が同じであり、両者の自由端エッジは、エッジ２ｂ１を折り込むことで行われる前述のクランピングによって、気密性ある形で相互に押し当たる。

【００３５】絞られた通路７は、グリッド９と１０の回りで、ほぼ全周にわたって延びている。溝１３は、開口

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２１から角度的に最も離れたそれの端部において、開口２２とほぼ揃ったところにあって通路７の両方の端の間の気密性ある仕切り部になっている壁部分２３によって限界されている。スカート２０は、仕切り部２３および開口２２と揃うところにおいて中断されている。それによってスカート２０を貫通するように形成された開口部２０ａが、仕切り部２３の寸法と嵌まり合う寸法になっているので、部品１１と１２が組み立てられたときには、開口部２０ａが、仕切り部２３に気密性ある形で係合する。

【００３６】それぞれ参照番号１１ａと１２ａで示されているスロットが、グリッド９と１０の壁を貫通するように形成されている。それらスロットは、グリッド９，１０のどちらにおいても、二つの主たる周囲を巡って均等に分布されている。スロット１１ａ同志間と１２ａ同志間には、固体としてのリング２７とアーム２４が延びていて、それらリングとアームは、バルブ部材８の面が当たる相手となる支持面を構成している。グリッド９と１０の各々が中央の突起２６を有していて、それら突起同志間にバルブ部材８が挟まれている。

【００３７】本発明は、より特定的には、グリッド９，１０とバルブ部材８に関している。バルブ部材８が当たる相手となるグリッド９の、複数の放射状アーム２４の面の上に、放射状リブ２５が分布配置されていて、それらリブ２５は、グリッド９の、スカート１６のエッジを収容している周囲領域からグリッドの中央に向かって延びている。開口２１に最も近いアーム２４は、グリッド９の挟み用突起２６に至るまでのほぼ全長にわたって延びているリブ２５を担持している。角度的に所与の方向でそれに続いている三つのアーム２４には、角度が増すと共に長さが低減しているリブ２５が設けられている。グリッドの、他の二つの放射状アーム２４、特には開口２２に最も近いアームは、そのようなリブ２５を有してはいない。グリッド１０は、どこにおいてもリブを担持していない。したがって、リブ２５は、軸線の回りに、不均一であって繰り返しのない形で分布配置されていることになる。

【００３８】各リブ２５の角度的厚さは、約１㎜であり、相隣る二つのリブ２５の相互に最も近い点の間は、10㎜よりも大きい距離をもって離れている。したがって、相隣る二つのリブ２５の外形同志の間の角度は、一つのそのようなリブ２５が延びている角度の10倍よりも大きい。

【００３９】バルブ部材８が変形する間には、このバルブ部材は、角度的に順次複数のリブ２５のところを巡って圧縮される。これらリブの設けられ方の故に、バルブ部材８の動きの対称性が破られている。バルブ部材の往復動変位の不連続性、特には、そのバルブ部材が放射状および環状の支持用面に当たるときの衝撃に起因する望ましくない騒音や衝突音という現象が相当に低減され

る。この、望ましくない現象の低減は、最も大きいリブ２５を、絞られた通路７の出入り口（開口２１）の近くに位置させること、そしてまた、グリッド１０がどこにおいてもリブを有していないという事実によって強調されている。

【００４０】他の変形の実施態様も可能である。リブの代わりに、グリッドおよびバルブ部材の軸線に関して繰り返しがない配置のどんな他のレリーフでも、特にはスタッドが、用いられ得る。スタッドは、グリッドをスタンピングして作られ得るものであり、球面のキャップの形をなしているのが有利である。

【００４１】不均一なレリーフをバルブ部材が担持していてもよいが、より大きい減衰が、グリッドで担持されたレリーフ、特に一つのグリッドによって担持されていてバルブ部材を挟むための突起２６と同様に働くレリーフ、によって得られる。

【００４２】衝突音や望ましくない騒音という現象の減衰は、接触する両面が、レリーフを有するのではなくてグリッドおよびバルブ部材の軸線の回りの全体にわたって角度的に不均一で繰り返しのない全体プロフィルを呈している場合にも得られる。そのような全体プロフィルに、角度的に不均一で繰り返しがないレリーフが組み合っているのが有利である。

【００４３】バルブ部材が前記グリッドに角度的に順次押し当たることは、剛性が前述の軸線に関して繰り返しのない不均一になったバルブ部材を用いることによっても達成され得る。この目的のためには、バルブ部材が、角度的に均一な材料でではあるが、厚さが角度的に繰り返しのない形で変化している厚さをもってできているならばよい。代案として、バルブ部材が不均一な材料で、つまり、バルブ部材に不均一な剛性が付与されるように、バルブ部材の厚さを通して一つまたはより多くのインサートが分布配置されていることとして作られていてもよい。

【００４４】経験が示すところによれば、グリッドにあるスロット１１ａ，１２ａのうちの少なくとも幾つかのものに沿って、バルブ部材８に面しているグリッドの面の中で、引っ込んだ領域１１ｂ，１２ｂ、すなわち“スポットフェイス”を設けることが、なお、特に有利である。これらのスポットフェイスは、フライス加工で形成され得るが、対応するグリッドと一体の型成形でも形成され得るものであり、そのような引っ込んだ領域に起因する表面の不連続性は、非対称のレリーフによる好ましい衝突音軽減効果を強化する。

【００４５】当然のことであり、上述のことからも知られるように、本発明は、なおも特定的に説明された特定の応用や実施例に限定されるのでは決してなく、むしろ逆に、本発明は、どんなそれの変形へも発展して行くものである。特にそれら変形を示すならば、下記のとおりである。

【００４６】バルブ部材が、円形ではなくて、回転の軸線に類似の一つの軸線、例えば繰り返しの軸線（すなわち、ｎを整数としてバルブ部材が前記軸線の回りで２π／ｎだけ回転させられたことでバルブ部材の外形が繰り返される）を限定する外形を有するという変形、特には、バルブ部材の外形が楕円形または長方形であるという変形。

【００４７】二つの油圧ダンパが並列に接続されていて、二つに分かれたバルブ部材が、それら二つの油圧ダンパのチャンバー相互間の連通を制御するという変形。

【００４８】ダンパーの二つのグリッドの間にあるバルブ部材が、中間仕切体６に設けられているのではなく、作動チャンバーＡの内側面上の別の位置、特にはベース１の近傍に設けられていて、そのバルブ部材は、チャンバーＡと第３のチャンバー（図示せず）の間の連通を制御しており、その第３のチャンバーは、同様に変形可能であるが、特にこの目的のために、気密的に取り付けられた柔軟性のメンブレンによって限定されていて、そのメンブレンの、問題のチャンバーの外側である面は、一つの空気チャンバーを限定していて、その空気チャンバーは、オプションとしてフォーム材料でライニングされてもよいが、直接に大気に接続していてもよい、という変形。

【００４９】問題の油圧ダンパが、本質的には直径に沿うように作動するスリーブの形のものであって、そこでの二つの剛性のフレーム部材は管状で、一方のものが他方のものの内側にあり、望ましくは、少なくとも荷重がかかった状態では円形の対称性で同心にある、という変形。

【００５０】油圧ダンパを構成しているフレーム部材の一つのものが、その油圧ダンパを貫通しているチューブの形をなしており、バルブ部材は、そのフレーム部材を包囲している一つの環状のプレートである、という変形。

【００５１】絞られた通路が、油圧ダンパの、中間仕切体の周辺部以外の部分において、特にはバルブ部材自体の中央領域を通るように形成されている、という変形。

【図面の簡単な説明】

【図１】本発明の特定の実施例を構成している油圧ダンパの軸方向断面図である。

【図２】図１の油圧ダンパの各グリッドの上面図である。

【図３】図１の油圧ダンパの各グリッドの下面図である。

【図４】図２のグリッドの線Ⅳ－Ⅳに沿う断面のほか、図１の油圧ダンパの、バルブ部材と他方のグリッドをも示している断面図である。

【符号の説明】

１　剛性のベース

１ａ　中央ヘッド

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１ｂ　シャンク
２　剛性のリング
２ａ，２ｂ　環状プレート
２ｃ　タブ
２ａ１，２ｂ１　折り返しリム
２ｃ１　固定用穴
３　エラストマー質の壁体
４　ベロー
５　剛性のギャップ
６　中間仕切体
７　絞られた通路
８　バルブ部材
８ａ　ハウジング
９，１０　グリッド
１１，１２　中間仕切体の部品（９，１０，７を含む）

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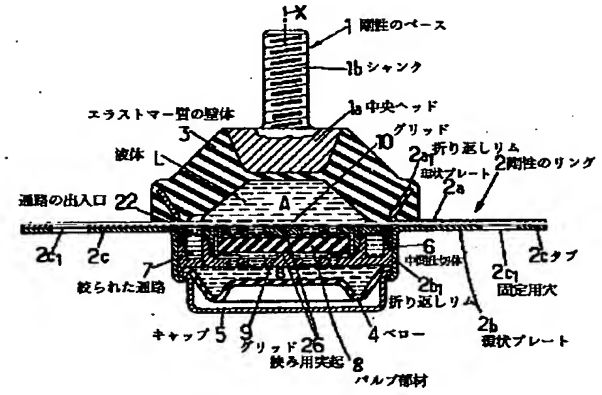
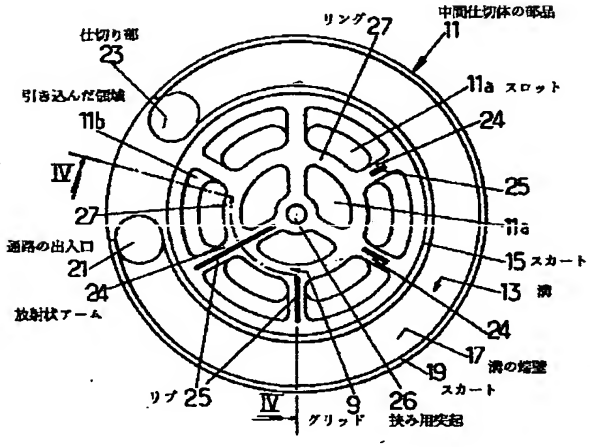
１１ａ，１２ａ　スロット
１１ｂ，１２ｂ　引っ込んだ領域
１３，１４　溝
１５，１６　スカート
１７，１８　溝の端壁
１９，２０　スカート
２０ａ　スカートの開口部
２１，２２　絞られた通路の出入り口
２３　仕切り部（壁部分）
２４　放射状アーム
２５　リブ
２６　挟み用突起
２７　リング
Ａ，Ｂ　チャンバー
Ｌ　液体

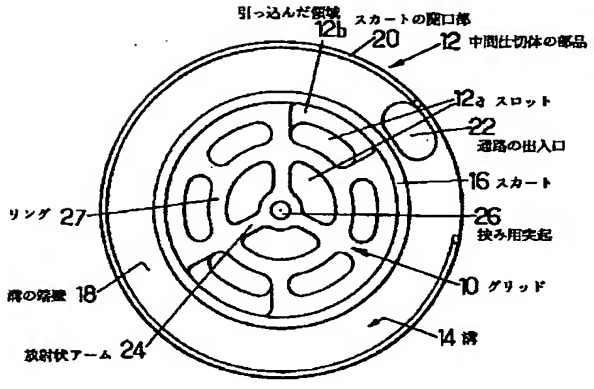
【図１】



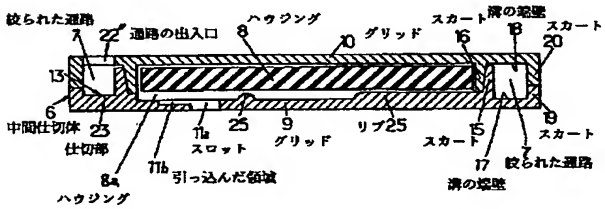
【図２】



【図３】



【図４】



フロントページの続き

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